western sections, where there were extensive areas with little or no rain or snow during the entire month.

In much of this western area the precipitation was the least of record for November since observations began, or at most it was the second November of no precipitation in more than 50 years. At a few places in the northern Plateau region, November is usually the month of greatest precipitation, but in the present November these places were frequently entirely without precipitation.

As a result of this deficiency in precipitation the water supply is greatly depleted, rivers are at low stages, springs and wells have gone dry in many instances, the fire hazard has been greatly increased, and forest fires have been controlled only with difficulty; while vegetation has been greatly retarded, winter pasturage is largely exhausted, and much stock feeding has been necessary.

SNOWFALL

The distribution of snow partook largely of that of a winter month from the Rocky Mountains eastward, the falls being widely distributed and the amounts in localities the greatest of record for November.

From the Great Plains eastward to the Atlantic coast there was more or less snow in all save the more southern districts, the falls being unusually heavy so early in the season over a considerable area from northwest Texas to the southern Appalachian Mountains, where falls near the end of the month ranged from 6 to 8 inches or more.

Farther north the amounts usually were less, until over North Dakota and some near-by areas where some snow that fell late in October remained unmelted at the end of that month, and, with amounts that occurred during November, formed a covering of snow that remained unmelted throughout the month. The total falls were comparatively heavy in the northern parts of the upper Lake region and locally in northern New York, but in New England the amounts for the month were mainly moderate. In the Rocky Mountains and over their eastern foothills good depths of snow were reported generally, but there was little in much of the Plateau region and practically none in the Sierra Nevada and Cascade ranges, none being reported from the highest peaks in California, a condition rarely experienced in that State.

RELATIVE HUMIDITY

Over much of the country from the Rocky Mountains eastward the percentages of relative humidity were above the monthly normals, save for small areas from the upper Lakes northeastward. In portions of the Rocky Mountains the departures from the normal were large, ranging up to 15 to 20 per cent. On the other hand, west of the Rocky Mountains, the humidities as represented by the departures from normal were mainly far less than normal, as would also be indicated by the great lack of precipitation in that area. This general dryness was augmented by the large percentage of sunshine in that region which averaged nearly 100 per cent of the possible at many places in California and other portions of the Southwest.

SEVERE LOCAL STORMS, NOVEMBER, 1929

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the annual report of the chief of bureau]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Crossroads, N. Mex.	8					Heavy hail	Considerable damage to range over 50 square miles.	Official, U. S. Weather Bureau.
Portland, Me., and vicinity.	17–19					Ice	Public utilities, especially telephone and telegraph companies, suffer heavy loss; many shade trees stripped; factories closed.	Do.
Iowa (parts of)	27					Wind and sleet	Plate-glass windows broken; many small buildings in rural sections wrecked.	Do.
Des Moines, Iowa	29					Wind	Small out buildings demolished; plate-glass windows broken.	Do.

RIVERS AND FLOODS

By MONTROSE W. HAYES

There were overflows in November, 1929, in the South Atlantic States and the Ohio River basin, but they were of minor importance, except in the Tennessee River and in that part of the east Gulf drainage area lying between the Apalachicola and the Mississippi Rivers.

Excessive rains fell from the 10th to the 17th in northwestern Georgia, Alabama, Mississippi, and the Louisiana Parishes east of the Mississippi River. There were numerous falls amounting to 10 inches in eight days, and one station, Helena, Ala., had 15.97 inches. The rivers began to rise rapidly on the 12th and 13th, flood stages were reached about the 15th, and in the lower reaches the overflow continued until the 25th. The water levels were not particularly high, but the inconvenience and damage were relatively great on account of the general overflow of all the minor streams, and the long continued flood in the larger rivers. The following tabular statement is a summary of the statistics of loss and damage. The information, of course, is not complete, but represents the best that is available.

	Alabama River system	Tombigbee-Black Warrior Rivers	Pascagoula and Pearl Rivers	Tennessee River	Total
Buildings, highways, bridges, etc.	$27,450	$89,000	$36,000	$2,200	$154,650
Matured crops	71,100	24,200	3,600	31,000	129,900
Prospective crops	[1] 5,250	[2] 2,700			7,950
Movable property, including livestock	850	80,000	2,500		83,350
Suspension of business, including wages	15,300	103,000	48,200	14,500	181,000
Total	119,950	298,900	90,300	47,700	556,850

[1] 1,100 acres. [2] 1,200 acres.

The warnings issued were timely and adequate. The savings effected through their use have been reported to have been $127,000 on the Alabama River system, $229,000 in the valleys of the Black Warrior and the Tombigbee, $26,000 in the Pascagoula and Pearl Valleys, and $8,500 in the Tennessee Valley, a total of $390,500.

Flood stage and crest data are given in the following table:

[All dates in November except as otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC DRAINAGE	*Feet*			*Feet*	
James: Columbia, Va	18	20	20	20.7	20
Tar:					
Tarboro, N. C	18	9	9	18.1	9
Greenville, N. C	14	(1)	1	18.8	Oct. 29
		9	11	14.5	10
Neuse: Smithfield, N. C	14	5	8	17.0	6
Cape Fear: Elizabethtown, N. C	22	6	7	24.1	6
Peedee: Mars Bluff, S. C	17	8	10	17.9	9
		30	(2)	17.0	30
Santee:					
Rimini, S. C	12	(1)	5	31.8	Oct. 6
		7	(2)	14.0	9, 10
Ferguson, S. C	12	(1)	(2)	21.0	Oct. 7
Saluda:					
Pelzer, S. C	7	18	18	7.0	18
Chappells, S. C	14	19	20	14.8	20
EAST GULF DRAINAGE					
Conecuh: Brewton, Ala	13	17	26	16.3	22
Alabama:					
Montgomery, Ala	35	15	25	47.9	19
Selma, Ala	35	15	28	50.7	20, 21
Coosa:					
Gadsden, Ala	22	15	25	26.0	18, 19
Lock No. 4, Lincoln, Ala	17	14	26	22.6	16
Wetumpka, Ala	45	17	20	48.7	18
Etowah: Canton, Ga	11	15	15	11.1	15
Oostanaula: Resaca, Ga	25	16	20	28.5	17, 18
Cahaba: Centerville, Ala	25	12	17	35.0	15
Tombigbee: Lock No. 4, Demopolis, Ala	39	14	(2)	63.7	21, 22
Black Warrior: Lock No. 10, Tuscaloosa, Ala	46	12	20	65.1	15
Chickasawhay:					
Enterprise, Miss	21	15	17	25.0	16
Shubuta, Miss	27	17	21	31.7	19
Leaf: Hattiesburg, Miss	19	16	18	22.0	16
Pearl:					
Jackson, Miss	20	17	(2)	25.8	23–26
Monticello, Miss	18	14	18	20.4	14
Columbia, Miss	18	15	21	23.5	16
Bogue Chitto: Franklinton, La	16	15	16	17.3	16
West Pearl: Pearl River, La	13	7	13	15.2	7
		16	(2)	16.3	18
MISSISSIPPI DRAINAGE					
Monongahela: Lock No. 7, Greensboro, Pa	30	18	18	30.2	18
Ohio: Dam No. 25, near Point Pleasant, W. Va	40	20	20	40.0	20
Hocking: Athens, Ohio	17	19	19	17.25	19
Tennessee:					
Widows Bar Dam, Ala	26	16	21		
Guntersville, Ala	31	18	19	31.0	18, 19
Florence, Ala	18	16	22	19.7	19
Riverton, Ala	33	16	24	39.0	20
Elk: Fayetteville, Tenn	14	3	3	15.0	3
		15	18	17.4	15
WEST GULF DRAINAGE					
Colorado: Columbus, Tex	28	9	9	30.0	9

[1] Continued from last month. [2] Continued at end of month.

EFFECT OF WEATHER ON CROPS AND FARMING OPERATIONS, NOVEMBER, 1929

By J. B. KINCER

General summary.—Early in the first decade weather conditions were generally unfavorable for outside operations in most places east of the Rocky Mountains and these detrimental conditions continued during the latter part in the South, although in the Southeast seasonal work made fairly good advance. Rain was needed in the Florida Peninsula, but there was a generally ample supply of soil moisture nearly everywhere east of the Rockies; west of the mountains droughty conditions continued. Cool weather brought frosts nearly to the southern part of the country, but with no material damage; there was some harm to livestock in the Northwest from the severe weather.

During the second decade frequent rains and muddy fields made conditions generally unfavorable for farm work in the central valleys and in much of the South, but rain was still needed in the extreme Southeast, especially on the uplands of Florida. There was some damage to outstanding crops from overflowed lowlands in parts of the Southeast. In the northern area conditions were more favorable for outside operations, with the snow cover decreased and free ranging of livestock permitted. Droughty conditions continued west of the Rocky Mountains.

The unseasonably cold weather during the last decade, attended by frequent rains in the Southeast and snows in the northern portions of the country, caused a general suspension of outdoor work. Freezing weather extended well into the southern portions of the country in the Southwest, with some damage to tender truck in Texas. At the close of the month there was a general, fairly good snow cover in most of the northern half of the country, affording protection to winter grains and meadows. Droughty conditions still prevailed west of the Rocky Mountains, with snow deficient on desert ranges.

Small grains.—During the first decade winter wheat continued to make good advance in the main producing sections, with generally ample soil moisture; some western parts of the belt reported the best moisture conditions in many years. Snows in parts of the Northwest were especially favorable for winter grains, but in the Pacific Northwest the continued dry conditions were very detrimental, delaying seeding, plowing, and germination.

East of the Rockies, satisfactory condition of winter wheat continued throughout the second decade and the crop entered the winter in generally good shape; snow was needed in some parts of the Rocky Mountain region, while the continued dry weather in the Pacific Northwest was very detrimental. Although there was only a light snow cover over parts of the winter-wheat belt during the last decade, no apparent damage was reported from the severe weather, and at the close of the month a fairly good cover over most parts afforded protection; droughty conditions still prevailed over the Pacific Northwest.

Corn and cotton.—Husking and cribbing corn was delayed during the first decade by frequent precipitation and wet fields; there was some improvement during the second decade, but many places were still too wet. During the last decade the cold weather which overspread the Corn Belt was beneficial in drying out the crop locally, while the frozen ground aided hand husking, although in some parts the rough fields made machine husking difficult.

The wet, cloudy weather during the first decade made the gathering of the remaining cotton difficult, especially in the western belt, and there were complaints of stained and damaged staple. Frequent rains during the second decade were detrimental to cotton picking, although some progress was made in the northeastern belt. During the last decade considerable advance was noted in gathering the remaining crop in the northern portions of the belt, while the absence of rain in Texas made better conditions for scrapping.

Miscellaneous crops.—Meadows and ranges were largely in satisfactory condition in most places east of the Rocky Mountains during the month, with some snow cover during the severe weather. Snows were beneficial in parts of the Rockies, while some range remained open, permitting much grazing. The continued dry conditions in the more western States caused marked deterioration of the range.

Winter and fall truck crops did well during most of the month, although there were some reports of sweet potatoes rotting in the ground in the Southeast, due to continued wet weather. More or less frost damage to truck occurred toward the close of the month in the Southeast. Citrus continued to do well generally.